

1. A computer-implemented method for biometric authentication, said method comprising:

reading a first live internal biological trait of an individual;

reading a second biological trait of said individual; and

5 authenticating the identity of said individual if both of said biological traits correspond with previously enrolled biological traits taken for said individual.

2. The method of claim 1 wherein said first live internal biological trait is a  
10 heartbeat.

3. The method of claim 2 wherein said first biological trait is measured by reflecting light off of the subdermal layers of skin tissue on said individual.

15 4. The method of claim 3 wherein said second biological trait is measured by reflecting light off of the skin of said individual.

5. The method of claim 4 wherein said step of authenticating is performed by a portable computerized device.

6. The method of claim 5 further comprising weighting some quantitative features of said biological traits more than other quantitative features of said biological traits.

5 7. The method of claim 6 further comprising means for verifying physiological activity.

8. The method of claim 1 wherein said second biological trait comprises the light absorption characteristics of the skin tissue of said individual.

9. A method comprising:  
reading a first live internal biological identifier of an individual, said first live  
internal biological identifier being a heartbeat waveform measured by  
reflecting light off of the subdermal layers of skin tissue on said individual;  
5 reading a second live internal biological identifier of said individual; and  
authenticating the identity of said individual if both of said biological identifiers  
correspond with previously enrolled biological identifiers taken for said  
individual.

10. The method of claim 9 wherein said second live internal biological  
identifier comprises the depth of a previously-identified layer of epithelial tissue.

11. The method of claim 9 wherein said second live internal biological  
identifier comprises bone density.

12. The method of claim 9 wherein said second live internal biological  
identifier comprises the retinal pattern of an iris.

13. The method of claim 9 wherein said method is performed by a single  
20 computer chip.

14. The method of claim 13 wherein said single computer chip is incorporated into a personal digital assistant.

15. The method of claim 9 further comprising weighting some quantitative features of said biological identifiers more than other quantitative features of said biological identifiers.

16. A method comprising:

presenting an individual's live body tissue to an authenticating device for the  
capturing of a first live internal biological identifier of said individual, said  
first live internal biological identifier being a heartbeat;  
5 providing a second biological identifier of said individual to said authentication  
device;  
upon authentication by said device, operating said device to perform functions  
previously inaccessible to unauthorized individuals, said authentication  
taking place upon the matching of both of said biological identifiers with  
10 previously enrolled biological identifiers taken for said individual.

17. The method of claim 16 wherein said second biological identifier comprises  
the light absorption characteristics of the skin tissue of said individual.

18. The method of claim 16 wherein said authentication is performed by a  
single computer chip.

19. The method of claim 16 wherein said authentication further comprises  
weighting some quantitative features of said biological identifiers more than other  
20 quantitative features of said biological identifiers.

20. A computer data signal embodied in a transmission medium such as a carrier wave comprising instructions for:

reading a first live internal biological trait of an individual;

reading a second biological trait of said individual; and

5 authenticating the identity of said individual if both of said biological traits

correspond with previously enrolled biological traits taken for said individual.

21. The signal of claim 20 wherein said first live internal biological trait is a heartbeat.

22. The signal of claim 20 wherein said first biological trait is measured by reflecting light off of the subdermal layers of skin tissue on said individual.

23. The signal of claim 20 wherein said second biological trait is measured by reflecting light off of the skin of said individual.

24. The signal of claim 20 wherein said step of authenticating is performed by a portable computerized device.

25. The signal of claim 20 further comprising weighting some quantitative features of said biological traits more than other quantitative features of said biological traits.

5 26. The signal of claim 20 further comprising means for verifying physiological activity.

27. The signal of claim 20 wherein said second biological trait comprises the light absorption characteristics of the skin tissue of said individual.

28. A computer-readable medium comprising instructions for:  
reading a first live internal biological identifier of an individual, said first live  
internal biological identifier being a heartbeat;  
reading a second live internal biological identifier of said individual; and  
5 authenticating the identity of said individual if both of said biological identifiers  
correspond with previously enrolled biological identifiers taken for said  
individual.

29. The medium of claim 28 wherein said second live internal biological  
10 identifier comprises the depth of a previously-identified layer of epithelial tissue.

30. The medium of claim 28 wherein said second live internal biological  
identifier comprises bone density.

15 31. The medium of claim 28 wherein said second live internal biological  
identifier comprises the retinal pattern of an iris.

32. The medium of claim 28 wherein said method is performed by a single  
computer chip.

20 33. The medium of claim 28 wherein said single computer chip is incorporated  
into a personal digital assistant.



34. The medium of claim 38 further comprising instructions for weighting some quantitative features of said biological identifiers more than other quantitative features of said biological identifiers.

35. A layered biometric authentication system comprising:  
a portable computerized device having an infrared emitter and detector operably  
connected to a single computer chip;  
means for capturing a first live internal biological identifier of an individual, said  
means being located on said portable device and operably connected to said  
computer chip, said first live internal biological identifier being a heartbeat,  
said first internal biological identifier being measured by reflecting light off  
of the subdermal layers of skin tissue on said individual;  
means for capturing a second live internal biological identifier of said individual,  
said means for reading the second biological identifier being located on said  
portable device and operably connected to said computer chip;  
means for verifying physiological activity, said verifying means being operably  
connected to said computer chip; and  
means for authenticating the identity of said individual if both of said biological  
identifiers correspond with previously enrolled biological identifiers taken  
for said individual, said means for authenticating weighting some  
quantitative features of said biological identifiers more than other  
quantitative features of said biological identifiers.